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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/765,822
Filing Date: January 27, 2004
Appellant(s): KRAJEWSKI ET AL.

WARN, HOFFMAN, MILLER & LaLONE, P.C.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 16 March 2011 appealing from the non-final office action mailed 21 January 2011.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application: 1-18 and 22-24.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

6,893,765	NISHIDA ET AL.	5-2005
6,974,648	GOEBEL	12-2005

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claims 1-18 and 22-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Nishida et al.-US 6,893,765. (Nishida)

With regard to claims 1, 2, 4-6, 9-12, 14-16, 18: Figure 1 and column 4, line 59 through column 5, line 65 of Nishida depict a fuel cell for use in an automotive application (see column 1, lines 5-9) comprising, as seen in Figure 1, a lower membrane 10 that is formed between a first upper metal anode bipolar plate 21 that includes trapezoidal-shaped anode flow channels 23' and a second lower metal cathode bipolar plate 31 that includes trapezoidal-shaped cathode flow channels 33'. The said flow channels extend through a middle portion of each respective bipolar plate as seen in Figure 1 and the said channels are provided at top and bottom outside edges of the respective bipolar plates. Column 9, lines 25-27 in Nishida set forth each of the anode and cathode bipolar plates formed of aluminum. The recitation of the extruded bipolar plates and the flow channels formed by an extrusion process are product-by-process limitations and are met by the teachings in Nishida as set forth above since there are no structural differences between the bipolar plates in Nishida and the claimed subject matter. As a note, column 5, lines 58-65 in Nishida set forth the anode separator plate and the cathode separator plate being formed at the same time as one piece, the same resultant when done by extrusion.

With regard to claims 3 and 13: Figure 1 in Nishida depicts a metal mesh 16 located between the anode bipolar plate 21 and the cathode bipolar plate 31-see also column 5, lines 5-8. In view of the configuration of the metal mesh, there would be sinusoidal-shaped coolant flow channels.

With regard to claims 7, 8 and 17: In view of the bipolar plates in Nishida having flow channels therein as discussed previously, it is inherent that recessed edges are

formed in the right side and the left side of the bipolar plates as seen in Figure 1. In addition, all of the bipolar plates 21 and 31 in the fuel cell stack in Figure 1 have recessed edges at the ends thereof, which recessed edges include end plates 37 and 27 that hold the bipolar plates together.

With regard to claims 22-24: Column 4, line 59 through column 5, line 65 of Nishida depict a fuel cell comprising, as seen in Figure 1, a lower membrane 10 on top of which is formed an anode side bipolar plate 21/31 that includes anode flow channels 23' on one side of the anode side bipolar plate and cathode side flow channels 33' on the opposite side of the anode side bipolar plate. On the bottom of lower membrane 10 is formed a cathode side metal cathode bipolar plate 31/21 that includes cathode side flow channels 33' on one side of the cathode bipolar plate and anode side flow channels on the opposite side of the cathode bipolar plate. Between the two respective anode and cathode bipolar plates are sinusoidal cooling flow channels through a metal mesh 16 as seen in Figure 1. These said cooling channels extend through a middle portion of each respective bipolar plate as seen in Figure 1. In view of the bipolar plates having flow channels therein as discussed previously, it is inherent that recessed edges are formed in the bipolar plates as seen in Figure 1. In addition, all of the bipolar plates 21 in the fuel cell stack in Figure 1 have recessed edges at the ends thereof, which recessed edges include end plates 37 and 27 that hold the bipolar plates together. The recitation of the extruded bipolar plates are product-by-process limitations and are met by the teachings in Nishida as set forth above since there are no structural differences between the bipolar plates in Nishida and the claimed subject matter. As a note,

column 5, lines 58-65 in Nishida set forth the anode separator plate and the cathode separator plate being formed at the same time as one piece, the same resultant when done by extrusion.

Claims 1-7, 10-17, 22, 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Goebel-US 6,974,648. (Goebel)

With regard to claims 1-6, 10-16: Reference is made to the Abstract of Goebel along with Figures 2-5 and column 1, lines 12-23; column 1, lines 55-67 and column 3, line 7 through column 5, line 57. These portions of Goebel describe and depict a fuel cell for use in an automotive application (see column 1, lines 12-15) comprising, as seen in Figure 3, a membrane 10 that is formed between a first upper metal cathode bipolar plate 62 (dual-layer) that include trapezoidal-shaped cathode flow channels 68 and a second lower metal anode bipolar plate 62 (dual-layer) that includes trapezoidal-shaped anode flow channels 66. Cooling fluid flow channels 70 extend through a middle portion of each respective bipolar plate as seen in Figure 2 and the said channels are provided at top and bottom outside edges of the respective bipolar plates. Column 4, lines 9-13 in Goebel set forth each of the anode and cathode bipolar plates formed of a metal. The recitation of the extruded bipolar plates and the flow channels formed by an extrusion process are product-by-process limitations and are met by the teachings in Goebel as set forth above since there are no structural differences between the bipolar plates in Goebel and the claimed subject matter.

With regard to claims 7 and 17: In view of the bipolar plates 62 in Goebel having flow channels therein as discussed previously, it is inherent that recessed edges are formed in the bipolar plates 62 as seen in Figure 3; which recessed edges can be seen in the right hand and left hand sides of the this figure. For example, as seen in Figure 3 of Goebel, the right side edge of the bipolar plate 62 has a recess therein, which recess allows gas to flow therethrough. Also, the left side edge of the bipolar plate 62 includes a recess at the end thereof, which recess also allows gas to flow therethrough.

With regard to claims 22 and 23: Reference is made to the Abstract of Goebel along with Figures 2-5 and column 1, lines 12-23; column 1, lines 55-67 and column 3, line 7 through column 5, line 57. Figure 3 in Goebel depicts a membrane 10 on the bottom of which is formed an anode side metal bipolar plate 62 that includes anode flow channels 66 on the upper side of the anode side bipolar plate and cathode side flow channels 68 on the opposite side of the anode side bipolar plate. On the top of membrane 10 is formed a cathode side metal cathode bipolar plate 62 that includes cathode side flow channels 68 on the lower side of the cathode bipolar plate and anode side flow channels 66 on the opposite side of the cathode bipolar plate. Formed in each of the anode side metal bipolar plate 62 and the cathode side metal bipolar plate 62 are rectangular shaped cooling flow channels 70 that extend through a middle portion of each respective bipolar plate as seen in Figure 3. In view of the bipolar plates 62 in Goebel having flow channels therein as discussed previously, it is inherent that recessed edges are formed in the bipolar plates 62 as seen in Figure 3; which recessed edges can be seen in the right hand and left hand sides of this figure. For example, as

seen in Figure 5 of Goebel, the right side edge of the bipolar plate 260 has a recess therein, which recess allows gas to flow therethrough. Also, the left side edge of the bipolar plate 260 includes a recess at the end thereof, which recess also allows gas to flow therethrough. The recitation of the extruded bipolar plates are product-by-process limitations and are met by the teachings in Goebel as set forth above since there are no structural differences between the bipolar plates in Goebel and the claimed subject matter.

(10) Response to Argument

A. Claims 1-18 and 22-24 are anticipated by Nishida

1. Nishida

Under this heading, no specific argument is set forth by appellant so no rebuttal is necessary.

2. Discussion of independent claims 1, 11 and 22

Appellant argues that bipolar plates in Nishida are different because they have a clear stamped plate profile. Reference is made to Figure 1 of Nishida where flow channels are depicted of a trapezoidal shape. This shape of flow channels in Nishida is the same configuration as the flow channels in the bipolar plate depicted by appellant in

Figure 3 of the present application. Therefore, the bipolar plates in Nishida have the same configuration and profile as the bipolar plates of appellant and thus the claimed subject matter is met by the teachings to Nishida. There is no structural difference between the bipolar plates in Nishida and appellant's claimed bipolar plates.

The appellant further argues that the bipolar plates made by an extrusion process have a different profile than a stamped plate. This argument was addressed in the previous paragraph of this answer and will not be repeated here. In any event, there is no inherent difference between the bipolar plates in Nishida and those claimed by appellant.

Appellant further argues that Nishida does not teach a bipolar plate for a fuel cell formed by an extrusion process and therefore cannot anticipate claims 1, 11 and 22. This may be true that Nishida does not specifically teach a bipolar plate formed by extrusion, however, appellant has claimed a product and not a method of making that product. In a product-by-process claim, the method of making the product is immaterial. As long as the reference teaches the final product, then the claim is anticipated. Nishida does such and therefore there are no claim limitations of appellant that are not present in the teachings of Nishida.

Next, appellant argues that claims 1, 11 and 22 are not product-by-process claims. It is true that most of the language in claims 1, 11 and 22 is not product-by-process terminology, however, the language in claim 1 for example, "extruded bipolar plates" and "formed by an extrusion process" are product-by-process terminology. This language sets forth a method by which the bipolar plates are formed and are product-

by-process limitations. As In Re Thorpe 227 USPQ 964 states, as long as a reference meets the limitations of the product of a product-by-process claim, then the claimed product is met by the teachings in the reference. It does not matter how the product is formed as long as the reference teaches the product limitations. As stated previously in this answer, Nishida teaches the limitations of the bipolar plates as appellant is currently claiming. There is no claimed subject matter not set forth in the teachings to Nishida.

A further argument by appellant is that Nishida does not teach trapezoiodal-shaped flow channels for the cooling fluid and thus does not teach the same structure for the bipolar plate claimed by appellant. As set forth in the rejection of claims 1, 2, 4-6, 9-12, 14-16, 18 and 22-24 outlined by the examiner previously in this answer, the cooling flow channels 16 in Nishida are sinusoidal shaped and thus meet appellant's claimed subject matter.

Appellant argues that Nishida does not teach recesses in the edges of the bipolar plates in Nishida. The examiner respectfully disagrees. By virtue of the bipolar plates in Nishida having peaks and valleys therein, the same forms recesses therein. With regard to Figure 1 in Nishida, the upper bipolar plate 21, for example, has a recess in the right side edge in which the end plate 37 is placed. Similarly, the left side edge of the upper bipolar plate 21 has a recess therein in which the end plate 17 is placed. It is noted that the edge of the plate 21 includes the outer peripheral right and left side portions of the bipolar plate which includes the area covered by the end plates and an opening through which gases flow.

3. Discussion of the dependent claims

Appellant argues that Nishida does not teach recesses in the edges of the bipolar plates in Nishida. The examiner respectfully disagrees for the same reasons previously presented.

B. Claims 1-7, 10-17, 22 and 23 are anticipated by Goebel

1. Goebel

The appellant argues that the bipolar plates made by an extrusion process have a different profile than a stamped plate. This is not convincing because the bipolar plates in Goebel have the same configuration and profile as the bipolar plates of appellant and thus the claimed subject matter is met by the teachings to Goebel.

2. Discussion of independent claims 1, 11 and 22

Appellant argues that Goebel does not disclose a metal bipolar plate for a fuel cell that is fabricated by an extrusion process. This is the same argument presented by appellant regarding the application of the Nishida reference against the claims. As argued for the Nishida reference, appellant has claimed a product and not a method of making that product. In a product-by-process claim, the method of making the product is immaterial. As long as the reference teaches the final product, then the claim is

anticipated. Goebel does such and therefore there are no claim limitations of appellant that are not present in the teachings of Goebel.

Appellant again argues, as they did for the application of the Nishida reference, that the bipolar plates made by an extrusion process impart a distinctive structural characteristic to the plate. This is not convincing because there is no inherent difference between an extruded bipolar plate and the plate set forth in Goebel. In addition, there is nothing in the claimed subject matter that distinguishes the same over the teachings in Goebel.

3. Discussion of the dependent claims

The appellant argues that Goebel does not show recessed edges in the bipolar plates. This argument is not convincing for the reasons presented previously in this answer.

Finally, appellant argues that Goebel does not disclose recessed edges for securing first and second bipolar plates together. This argument is deemed moot in view of the fact that this subject matter, which is set forth in claims 8 and 24, has not been rejected over Goebel.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/John S. Maples/

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